

ABSTRACTS

The purpose of the abstracts is to give sufficient information about the subject matter of each publication to enable readers to decide whether to read it. No review or evaluation is intended. Printing is arranged so that individual entries may be cut or mounted for filing in a five-by-three inch system. The indexing terms (in boldface capitals) refer only to aspects of the publication of interest to historians of mathematics, including some topics in general history of science and historiography, but not other topics unless there is a fairly close link with mathematics or its history. We hope to publish cumulative subject indices.

Readers are invited to send reprints, autoabstracts, corrections, additions, and notices of publications that have been overlooked. Be sure to include complete bibliographic information. We need volunteers willing to cover one or more journals for this department.

MR 46 #3255 means that the item is numbered 3255 in volume 46 of Mathematical Reviews. RZ 1973 #3A14 means that the item is numbered 3A14 in the third number of the 1973 volume of the Referativny Zhurnal. Z 50 4 means volume 50, page 4 of the Zentralblatt.

The symbol * in the margin indicates a publication that deserves more discussion than it may ordinarily get in the Reviews Department (either because it is an article rather than a book or because it is such a large book that a single review cannot deal with it fully). Readers are invited to comment by letter for our Correspondence Department and by submitting manuscripts of reviews or articles.

EULER, L 1975 *Briefwechsel. Opera Omnia. Series Quarta A: Commmercium Epistolicum* [COLLECTED WORKS of L EULER. Series IV A: CORRESPONDENCE] Vol. I. Edited by A.P. Yushkevich, V. Smirnov, W. Habicht, assisted by J.J. Burckhardt, J.O. Fleckenstein, & A.T. Grigoriyan. Under joint auspices of the Academy of Science of the USSR and the Schweizerischen Naturforschenden Gesellschaft. Basel (Birkhäuser) 674 p. \$60 First of 7 volumes of correspondence and 4-6 of manuscripts that will make up Series IV. The previous series were I (mathematics) in 29 volumes, II (mechanics and astronomy) in 31, and III (physics and Misc.) in 12. Contains descriptions and summaries of the letters and various tables and indexes. Fine colour PORTRAIT.

DUDEK, Peter 1975 Zur gesellschaftlichen Funktion der Mathematik in der antiken Produktionsweise [On the social function of mathematics in ancient production] *M. Z. Berufspraxis Math.* (Bielefeld) (14), 165-183
ANCIENT MATHEMATICS. MATHEMATICS AND SOCIETY. ROLE OF MATHEMATICS. SOCIOLOGY OF MATHEMATICS.

PIER, Jean-Paul 1975 *Actes du Colloque sur les Mathématiques et la Réalité, 17-18 Mai 1974, Centre Universitaire de Luxembourg* Luxembourg 86 p
Originally published in *Dialectica* 29(1). NATURE OF MATHEMATICS. PHILOSOPHY OF MATHEMATICS. Contributions of Guy Hirsch, Ferdinand Gonseth, Jean Dieudonné, Herbert Meschkowski, René Thom. List of participants.

SIERPINSKI, Wacław 1975 *Oeuvres choisies. Tome II: Théorie des ensembles et ses applications; travaux des années 1908-1929* Edited by S. Hartman, K. Kuratowski, E. Marczewski, A. Mostowski, and A. Schinzel Warsaw (Editions Scientifiques de Pologne) 780 p
SELECTED WORKS. This second of three volumes contains a PORTRAIT of the young Sierpinski, an analysis of his on ABSTRACT SET THEORY (by Hartman and Marczewski), GENERAL TOPOLOGY (by Marczewski), MEASURE, CATEGORY, and REAL FUNCTIONS (by Hartman); and 131 articles (many previously available only in Polish, now in French) on the above subjects, including eight papers co-authored with N. LUSIN, four with K. KURATOWSKI, three with S. MAZUR-KIEWICZ, and one each with B. KNASTER, O. NIKODYM, S. SAKS, and A. ZYGMUND. The first volume (see HM 2, 109) listed all Sierpinski's publications. The third will include his papers on set theory and its applications after 1929. (G.H. Moore)

GERSTELL, Marguerite 1975 Prussian education and mathematics *Amer. Math. Mon.* 82, 240-245
EDUCATION. A description of XIX century GYMNASIEN in PRUSSIA, to support the author's thesis that she has "found a case where the progress of mathematical education correlates exceptionally well with the progress of mathematics itself, as measured by the number of creative mathematicians working." BIBLIOGRAPHY. (H.S. Tropp)

JAMES, R D 1975 EIZENS LEIMANIS, BIOGRAPHY *Canadian Mathematical Congress Notes* 7(6), 5
OBITUARY.

LAI, Tyrone 1975 Did Newton renounce infinitesimals?
Historia Mathematica 2, 127-136 INFINITESIMALS.
I NEWTON. Answer: No.

BURCKHARDT, H H 1975 Address on the 65th birthday of
J.E. Hofmann at Oberwolfach *HM* 2, 137-146 J E HOFMANN.
Reprint of this 1965 talk with OBITUARY postscript.

SCRIBA, C J 1975 Chronology of J.E. Hofmann, bio-
bibliographic note, and supplementary bibliography of
his publications *HM* 2, 147-152 J E HOFMANN. BIBLIO-
GRAPHY.

CHOQUET, Gustave 1975 Notice sur les travaux scienti-
fiques [Comments on my scientific work] *HM* 2, 153-160
The "Notice" prepared by candidates for election to the
Academy. G CHOQUET.

CROWE, Michael J 1975 Ten "laws" concerning patterns
of change in the history of mathematics *HM* 2, 161-166
HISTORIOGRAPHY. HISTORICAL THEORY.

SELENIUS, Clas-Olof 1975 Rationale of the Chakravāla
process of Jayadeva and Bhāskara II *HM* 2, 167-184
BHASKARA II. P FERMAT. JAYADEVA. HINDU MATHEMATICS.
INDIAN MATHEMATICS. PELL EQUATION.

MAY, Kenneth O 1975 Historiographic vices I. Logical
attribution *HM* 2, 185-187 HISTORIOGRAPHY. The
fallacious attribution of results that are logically
connected to established knowledge.

HENDY, M D 1975 Euclid and the fundamental theorem
of arithmetic *HM* 2, 189-191 EUCLID. FUNDAMENTAL
THEOREM OF ARITHMETIC. Euclid's proof is inapplicable
for numbers containing square factors.

NORTON, B J 1975 History of the Biometric school of
statistics and its influences on the social sciences
HM 2, 194 BIOMETRICS. SOCIAL SCIENCES. STATISTICS.
Report on an ongoing project.

PYENSON, Lewis 1975 'Mathematics' -- singular or plural? *HM* 2, 197-199 In answer to a comment in *HM* 1, 456, argues that the plural in Roman tongues is appropriate. TERMINOLOGY.

SHIMODAIRA, Kazuo 1975 Seki's Collected Works
HM 2, 195 T SEKI. COLLECTED WORKS.

JONES, Charles V 1975 Reviews of old books *HM* 2,
199 Advocates retrospective REVIEWS of older books.

GRATTAN-GUINNESS, Ivor 1975 The mathematical papers
and library of Sir Edward Collingwood in the University
of Durham *HM* 2, 200-202 E COLLINGWOOD. DURHAM
UNIVERSITY. ARCHIVES. LIBRARIES.

GRAY, J D 1975 Archives of mathematical journals
HM 2, 202 JOURNAL ARCHIVES. Reports on the unavail-
ability of archives of the *Annals of Math*, *Crelle*,
London Math. Soc. journals, *Math Annalen* and *Math.*
Zeitschrift.

WILCOX, A B 1975 Henry L. Alder *Amer. Math. Mon.*
82, 110-113 MATHEMATICAL ASSOCIATION OF AMERICA.
ANECDOTES. H L ALDER. Reminiscences on the occasion
of Prof. Alder's retirement after 15 years as secretary
of the MAA. (*H.S. Tropp*)

BAKER, Keith Michael 1975 *Condorcet. From Natural
Philosophy to Social Mathematics* Chicago and London
(University of Chicago Press) 552 p. M-J-A-N C MARQUIS
DE CONDORCET and his conception of SOCIAL SCIENCE,
especially the application to it of mathematics.

ERRATA

In *HM* 1, 492: MENSHIKOV, I G 1972 should be MELNIKOV, I G
1972

In *HM* 1, 493 GAIDUK, Yu & S A KAKHIA should be GAIDUK, Yu &
S A DAKHIA

Please correct your copies. (Thanks to Yu. Gaiduk for noting
these errors.)

BERNKOPF, Michael 1975 *Mathematics: An Appreciation* Boston (Houghton Mifflin) 276 p US \$12.05 TEXTBOOKS WITH HISTORICAL NOTES. This elementary text for liberal arts students includes historical notes on GEOMETRY, MECHANICS, and the CALCULUS. Topics treated without historical notes are algebra, logic, probability, and analytic geometry. There are many exercises and an historical BIBLIOGRAPHY. (G.H. Moore)

BONELLI, M L & William R SHEA 1975 *Reason, Experiment, and Mysticism in the Scientific Revolution* New York (Science History Publications) 320 p \$20 MECHANICS. SCIENTIFIC REVOLUTION. XVI. Sixteen papers written for a symposium organized by the Gruppo italiano di storia della scienza at Capri in April 1974. Includes papers by Stillman Drake and Pierre Costabel on GALILEO's experiments relating to FREE FALL, and by René Taton on the "mathematical revolution" of the XVII century.

PRICE, Derek de Solla 1975 *Gears From the Greeks. The Antikythera Mechanism -- a Calendar Computer From ca. 80 B.C.* New York (Science History Publications. Neale Watson) 70 p Reprinted from the *Transactions of the American Philosophical Society* (NS)64(7). CALCULATING INSTRUMENTS. CALENDARS. CLOCKS. GEARS. GREEK TECHNOLOGY. A full account of the history and present knowledge concerning this find, which calls for a new judgement on the level of ancient technology. Many photographs, diagrams, and radiographs. Price published a preliminary popular account in the *Scientific American* for June 1959.

ROBINSON, G de B 1975 Biography, Cecelia Krieger-Donaj *Canadian Math. Congress Notes* 7(5), 1-2 C KRIEGER-DONAJ. OBITUARY. Canada's third (first woman) mathematics Ph.D., translator of W SIERPINSKI, and long time faculty member at the UNIVERSITY OF TORONTO.

DRAKE, Stillman 1975 Impetus theory reappraised *J. History of Ideas* 36(1), 27-46 G B BALIANI. DISCRETE VS CONTINUOUS. H FABRI. FREE FALL. GALILEO. IMPETUS. INERTIA. INFINITESIMALS. KINETICS. PROPORTION. QUANTIZATION.

BOAS, R P, Jr 1975 Award for distinguished service to Professor SAUNDERS MAC LANE *Amer. Math. Mon.* 82, 107-109 AWARDS. PORTRAIT. (*H.S. Tropp*)

ROBINSON, F J G & P J WALLIS *Book Subscription Lists. A Revised Guide* Newcastle upon Tyne (Harold Hill and Son) 144 p BIBLIOGRAPHY. A chronological list of books having subscription lists from 1617 to 1974 with indexes (author, book traders, provincial imprint), bibliography, and introduction describing lists, uses, and the Book Subscriptions List Project.

DANIELS, Norman 1975 Lobachevsky: Some anticipations of later views on the relation between geometry and physics *Isis* 66(231), 75-85 N I LOBACHEVSKII. GEOMETRY FOUNDATIONS. NATURE OF MATHEMATICS. PHILOSOPHY OF MATHEMATICS. PHYSICS.

FANG, J & K P TAKAYAMA 1975 *Sociology of Mathematics and Mathematicians -- A Prolegomenon* (Paideia Press) 364 p This number 15 of Fang's "Paideia Studies in the Nature of Modern Mathematics" is "an anticipatory study ... in the form of 'pre-publication'" of essays on various topics related to PHILOSOPHY OF MATHEMATICS, HISTORICAL THEORY, and SOCIOLOGY OF MATHEMATICS.

TODD, John 1975 Numerical analysis at the National Bureau of Standards *SIAM Review* 17, 361-370 INSTITUTE FOR NUMERICAL ANALYSIS. NUMERICAL METHODS. An account of some of the activities of the NATIONAL BUREAU OF STANDARDS, originally organized by Dr. E.U. CONDON under the leadership of Dr. JOHN H. CURTISS from 1946-1972. Chronological chart of group leaders, the formation of professional societies and the establishment of journals. Extensive BIBLIOGRAPHY. (Originally presented at the SIAM Fall Meeting, 17 October 1972.) (*H.S. Tropp*)

MINC, Henryk 1975 Six letters from ALEXANDER C. AITKEN *Linear and Multilinear Algebra* 2, 1-12 The letters (to E.M.H. Etherington) concern a problem concerning EIGENVALUES suggested by Marvin Marcus and record the writer's HEURISTIC activity.

KONE, Eugene H and Helene J Jordan editors 1974 *The Greatest Adventure. Basic Research That Shapes Our Lives*. New York (Rockefeller University Press) 301 p
APPLICATIONS. COMPUTERS. A collection of essays written in response to the question: "How has basic research led to practical applications that have affected the lives of men?" The one article related to mathematics is "Will computers replace humans?" by Mark Kac. (His answer is in the negative.)

TSELUSHCHEB, V V 1974 *Logicheskaya istina i empirizm* [Logical truth and EMPIRICISM] Novosibirsk (Nauka) 113 p
PHILOSOPHY OF MATHEMATICS. Three chapters on FORMAL SYSTEMS, logical TRUTH, mathematical truth. Mainly concerned with problems arising from recent results in FOUNDATIONS OF MATHEMATICS.

BRUSH, Stephen G 1974 The development of the kinetic theory of gases. VIII. Randomness and irreversibility *Arch. History Exact Sci.* 12(1), 1-88
GASES. KINETIC THEORY. PROBABILITY IN PHYSICS.

BRUSH, Stephen G 1973 The development of the kinetic theory of gases. VII. Heat conduction and the Stefan-Boltzmann Law *Arch. History Exact Sci.* 11(1), 38-96
HEAT TRANSFER. KINETIC THEORY. XIX.

BYCHKOV, V P and K S SIBIRSKII 1974 *Razvitie matematiki v Moldavskoi SSR. Kratkii ocherk* [Development of mathematics in the Moldavian SSR. Short sketch] Kishinev (Izd. Shtiinstsa) 47 p
In the history of mathematics in MOLDAVIA, three periods are distinguished: (1) from the formation of the Moldavian Autonomous SSR in 1924 to the founding of the KISHINEV State University in 1945 -- a period primarily of EDUCATION, (2) to the organization of the Moldavian Academy of Science in 1961 -- beginnings of research, (3) the growth since then of a Moldavian school of mathematics. Work in the history of mathematics is reported also (pp. 36-37).

ANON 1974 Isaak S. Bruk *Soviet Computer Scientist Communications of the ACM* 17, 726
ISAAC S BRUK. OBITUARY. (H.S. Tropp)

GONSETH, Ferdinand 1974(1926) *Les fondements des mathématiques. De la géométrie d'Euclide à la relativité générale et à l'intuitionisme* [The FOUNDATIONS of mathematics from EUCLIDEAN GEOMETRY of RELATIVITY and INTUITIONISM] Preface by J. Hadamard. Facsimile REPRINT by the original publisher. Paris (Albert Blanchard) 243 p 45 F.

BARBEAU, E J 1974 Euler's nonstandard analysis *Canadian Math. Congress Notes* 7(4), 6-9 DIVERGENT SERIES. L EULER. INFINITESIMALS.

JAOUCHE, Khalil 1974 Le livre du qarastūn de Tābit ibn Qurra. Etude sur l'origine de la notion de travail et du calcul du moment statique d'une barre homogène [The book of the LEVER by THABIT IBN QURRA. A study on the origin of the concept of WORK and of calculation of the STATIC MOMENT of a homogeneous bar] *Arch. History Exact Sci.* 13(4), 325-347 ARAB MATHEMATICS. BALANCE. STATICS. X. Based on the author's 1972 University of Paris-Sorbonne theses, which includes also an Arabic edition of the work with French translation. Argues for its originality (in opposition to previous opinions), discusses its place in relation to ANCIENT AND MEDIEVAL MECHANICS, and analyzes its sources and concepts.

TROPP, Henry S 1974 The effervescent years: a retrospective (Computer report VII) *IEEE Spectrum* 11(2), 70-79 HOWARD AIKEN. COMPUTERS. J P ECKERT. ENIAC. HERMAN GOLDSTINE. GEORGE STIBITZ. UNIVAC I. JOHN VON NEUMANN.

SPECTRUM STAFF 1974 *IEEE Spectrum* computer milestones *IEEE Spectrum* 11(2), 80-81 A chart showing relationships between early works and COMPUTERS, with brief commentary.

HAWKINS, Thomas 1974 New light on Frobenius' creation of the theory of group characters *Arch. History Exact Sci.* 12(3), 217-243 A sequel to his 1971 paper (*Arch. History Exact Sci.* 7, 142-170) on GROUP CHARACTERS, based on recently discovered letters from F G FROBENIUS to R DEDEKIND.

ARITHMETIC TEACHER 1974 *Cumulative Index. The Arithmetic Teacher 1954-1973, Volumes 1-20* (National Council of Teachers of Mathematics) 124 p JOURNAL INDEXES. Articles are indexed by author, by first significant word in the title, and by title under 61 topics.

OLEINIK, O A 1974 The mathematical works of I G PETROVSKII *Moscow Univ. Math. Bull.* (transl. of *Vestnik Moskov Univ. Ser. I Mat. Meh.*) 29(1), 1-20 BIBLIOGRAPHY. BIOGRAPHY. DIFFERENTIAL EQUATIONS. ALGEBRAIC GEOMETRY. FUNCTION THEORY. MATHEMATICAL PHYSICS. PORTRAIT. PROBABILITY THEORY. (D.E. Kullman)

BROWN, Sanborn C & Leonard RIESER 1974 *Natural Philosophy at Dartmouth. From Surveyors' Chains to the Pressure of Light* Hanover, N.H. (University Press of New England) 139 p Though concerned with the emergence of PHYSICS from "Natural Philosophy" and SURVEYING in the XVIII century to a research profession in the XIX and XX at DARTMOUTH COLLEGE, most of the professors discussed devoted a good part of their time to MATHEMATICS EDUCATION, including EBENEZER ADAMS (PORTRAIT), CHARLES F EMBERSON, JOHN HUBBARD (PORTRAIT), JAMES PATTERSON, BEZALEEL WOODWARD (PORTRAIT), CHARLES YOUNG, IRA YOUNG (PORTRAIT).

NEUENSCHWANDER, E 1974 *Die stereometrischen Bücher der Elemente Euklids* [The Stereometric Books of EUCLID's Elements] *Arch. History Exact Sci.* 14(2), 91-125 VOLUMES. The logical and conceptual structure and the origins of Books xi-xiii and the early history of STEREOOMETRY.

CARTAN, Elie 1974 *Notice sur les travaux scientifiques, suivi de Le parallelism absolu et la theorie unitaire du champ* [Notice on scientific works, followed by Absolute parallelism and unified field theory] Paris (Gauthier-Villars) 128 p The Notice, written in 1931 as the standard summary of work required of candidates for election to the Academy, is here reprinted with a few references to later work, preceded by a chronology and complete BIBLIOGRAPHY, and followed by a 17-page paper on RELATIVITY, UNIFIED FIELD THEORY, and PARALLELISM (about whose origin no information is given), but without any biographical, mathematical, or editorial commentary.

HOUSEHOLDER, Alston S 1974 Schröder and Trudi:
A historical excursion *SIAM Review* 16, 344-348
H EGGERS. M JENKINS. J TRAUB. N TRUDI. ALGORITHMS.
ZEROS OF A POLYNOMIAL. This note (originally presented
at Galtinburg V, Los Alamos, New Mexico, June 1962)
discusses some of the basic ideas in a paper of
E SCHRÖDER (1870) and indicates their relationship to
subsequent developments, including an algorithm of
SILVA and the development of globally convergent
iterations by J TRAUB and M JENKINS. (*H.S. Tropp*)

SHAPER, Dudley 1974 *Galileo. A Philosophical Study*
Chicago & London (University of Chicago Press) 172 p
\$9.75 EMPIRICISM. GALILEO. MECHANICS. PHILOSOPHY
OF SCIENCE. RATIONALISM. SCIENTIFIC REVOLUTIONS.

DRAKE, Frank R 1974 *Set Theory: An Introduction to
Large Cardinals* Amsterdam (North Holland) 351 p
SET THEORY. MODELS OF SET THEORY. TREES. REFLECTION
PRINCIPLES. This advanced TREATISE WITH HISTORICAL
NOTES (with exercises and 20-page bibliography)
summarizes the work on LARGE CARDINALS, primarily by
A TARSKI and his students, from 1950 to 1973. (*G.H. Moore*)

PONT, Jean-Claude 1974 *Pétite enfance de la topologie
algébrique* [The early infancy of algebraic topology]
L'Enseignement Math. 20, 111-126 ANALYSIS SITUS.
HOMOTOPY. TOPOLOGY OF SURFACES. Summarizes the develop-
ment of ALGEBRAIC TOPOLOGY prior to the work of Poincaré.
Major attention is given to the contributions of L EULER,
C F GAUSS, J B LISTING, G B RIEMANN, A F MOBIUS, C
JORDAN, F KLEIN, and W DYCK. Several other mathematicians
are mentioned briefly. (*D.E. Kullman*)

ADAMCZEWSKI, Jan 1974 (?n.d.) NICOLAUS COPERNICUS
and His Epoch Philadelphia & Washington, DC (Copernicus
Society of America) A profusely illustrated POPULARI-
ZATION focused on "his epoch."

SKLAR, Lawrence 1974 *Space, Time, and Spacetime*
(University of California Press) 435 p PHILOSOPHY OF
PHYSICS. PHILOSOPHY OF MATHEMATICS. Mostly philosophy,
but some history of GEOMETRY, SPACE, TIME, NON-EUCLIDEAN
GEOMETRY, RELATIVITY, TOPOLOGY.

NITSCHKE, Johannes C C 1974 Plateu's problems and their modern ramifications *Amer. Math Monthly* 81, 945-968 CURVATURE. SURFACES. Selected topics from the writings of J A F PLATEAU with a discussion of their current state, biography, PORTRAIT. (H.S. Tropp)

KLEIN, Felix 1974(1872) *Das Erlanger Programm "Vergleichende Betrachtungen über neuere geometrische Forschungen"* [Comparative remarks on recent geometrical research] Edited with a biographical and a historical note by Hans Wussing Leipzig (Akademische) (Ostwalds Klassiker #253) 84 p REPRINT of the CLASSIC inaugural lecture on INVARIANCE, GROUP THEORY, and GEOMETRY. The version here is the last of many revisions and annotations by Klein, which appears in his *Gesammelte Math. Abhandlungen*, vol. 1, p. 460- 497

KLEIN, Felix 1974(1872) *Le programme d'Erlangen. Considérations comparative sur les recherches géométriques modernes* [Comparative remarks on modern geometric research] With a preface by J Dieudonné and postscript reprinting P F Russo's 1968 lecture at the Palais de la Découverte. Paris (Gauthier-Villars) 72 p REPRINT of the CLASSIC on INVARIANCE, GROUP THEORY and GEOMETRY in the contemporary translation by M.H. Padé, which incorporated some changes that Klein had made for the Italian translation.

WICKELGREN, Wayne A 1974 *How to Solve Problems. Elements of a Theory of Problems and Problem Solving.* San Francisco (W H Freeman) 262 p First substantial effort since Polya's classic works. Takes account of recent work in ARTIFICIAL INTELLIGENCE and COMPUTER SIMULATION. Not historical, but relevant to the history of HEURISTIC and PROBLEMS.

EMOND, André 1974 *La solution du 3^e problème du Hilbert et quelques développements récents* [Solution of HILBERT'S 3rd PROBLEM and some recent developments] Essai de maîtrise, Université Laval, supervised by Günther Frei. Typescript. Proofs from the M DEHN necessary condition of EQUIDECOMPOSABILITY of two polyhedra in 1900 to the J - P SYDLER proof of sufficiency in 1965, and later refinements and extensions.

GUTER, R & Yu POLUNOV 1974 *Pervaya programmistka* [The first programmer] *Nauka i zhizn* (9) (September), 134-136 A popular outline of the biography of AUGUSTA ADA LOVELACE (daughter of the poet GEORGE BYRON), her interest in the computer of CHARLES BABBAGE, her program for computing the BERNOULLI NUMBERS, her views on universal computers, A TURING's disagreement with certain views of Lady Lovelace on programming. (B.M. Schein)

MAXFIELD, Margaret 1974 Mixture problems by some "old math" *The Mathematics Teacher* 67(5), 426-427
ALLIGATION. PROBLEM SOLVING. A brief discussion of mixture problem solving in textbooks before 1900. (J.K. Bidwell)

YOUNG, W H 1974 *Report on the Study of Mathematics on the Continent of Europe* University of Calcutta 264 p EDUCATION. INSTITUTIONS. Complete text of an unfinished report written by Young for the University of Calcutta during the First World War, now published under the direction of Professor P K Bose (Pro-Vice-Chancellor for Academic Affairs of the University) in the state in which Young left it. Some extracts have appeared in my 'University mathematics at the turn of the century...' *Ann. Sci.* 28(1972), 369-384. The book also contains Young's inaugural lecture of his Calcutta Professorship (item 150 in my "mathematical bibliography for W.H. and G.C. Young" *HM* 2,43-58) (I. Grattan-Guinness)

KNOBLOCH, Eberhard 1974 *Studien von Leibniz zum Determinantenkalkül* [Studies on DETERMINANTS by LEIBNIZ] *Akten des II Int. Leibniz-Kongresses*, Hannover, 17-22 Juli 1972 Wiesbaden (Franz Steiner) Vol. II, 37-45

BOHL, Piers G 1974 *Sobranie trudov* [COLLECTED WORKS] Translated from the German by I M Rabinovich, with an introductory biographical note and commentary by L E Reisin and I A Khenin. Riga (Zinatne) 517 p Includes all his works except a paper on molecular attraction and a textbook in Russian published in 1921 when he was teaching at the University of Riga.

PAIOW, Michael 1974 Die mathematische Staatsstelle. II [The mathematical passage in Plato's *Republic*. II] *Arch. History Exact Sci.* 12(2), 174-185 NUPTUAL, GEOMETRIC NUMBER.

SHINGAREV, G 1974 Sovetnik vsevyshnego [Advisors of the Most High] *Khima i zhizn.* (1), 40-49; (2), 62-71 A popular paper on G W LEIBNIZ and I NEWTON, their biographies, contributions, rivalry. (B.M. Schein)

MAISTROV, L E 1974 *Probability Theory. A Historical Sketch* Trans. from Russian ed.(1967) and ed. by Samuel Kotz New York and London (Academic Press) 294 p MATHEMATICS AND SOCIETY. Intended to complement Todhunter's classic of 1865. Especially noted by Ian Hacking in a foreword and by the translator are the accounts of the RUSSIAN SCHOOL OF PROBABILITY, A A MARKOV, P L CHEBYSHEV, A N KOLMOGOROV, S N BERNSTEIN, V Ya BUNYAKOVSKII, N I LOBACHEVSKII, A M LYAPUNOV, M V OSTROGRADSKII, S REVKOVSKII, and especially the ST PETERSBURG SCHOOL; the economic origins of PROBABILITY THEORY; and the work of B SPINOZA, R ADRAIN (not Adrian!) and GALILEO. Of course the work of many non-Russians is covered (e.g. C F GAUSS, P S LAPLACE, J BERTRAND), but the relation to statistics is nearly ignored. The translator has supplemented and corrected the original and added 45 titles to the bibliography.

BEUMER, Martin G 1974 The definite integral symbol *Amer. Math. Monthly* 81, 1095-1096 HUMOR. NOTATION. A whimsical account of the origin of the integral symbol attributed to the German Nobel-Laureate chemist J H van't Hoff. (H S Tropp)

OLMSTED, H M H 1974 R W Brink -- An obituary *Amer. Math. Monthly* 81, 873-875 RAYMOND WOODWARD BRINK. BIOGRAPHY. OBITUARY. U MINNESOTA. (H.S. Tropp)

CARTWRIGHT, M 1974 Some points in the history of the theory of non-linear oscillations *Bull. Inst. Math. Appl.* 10, 329-333 NON-LINEAR SYSTEMS. DE VON DER POL'S EQUATION. RADIO ENGINEERING. DIFFERENTIAL EQUATIONS. (I. Grattan-Guinness)

BOS, H J M 1974 Differentials, higher-order differentials and the derivative in the Leibnizian calculus *Arch. History Exact Sci.* 14(1), 1-90
CALCULUS. B CAVALIERI. DERIVATIVES. DIFFERENTIALS.
L EULER. FUNCTION. INDIVISIBLES. INFINITESIMALS.
INFINITY. G LEIBNIZ. NONSTANDARD ANALYSIS.
VARIABLE. Based on a doctoral thesis at Utrecht sponsored by H. Freudenthal and J.R. Ravetz.

MOESGAARD, Kristian Peder 1974 Thabit Ibn Qurra between Ptolemy and Copernicus: An analysis of Thabit's solar theory *Arch. History Exact Sci.* 12(3), 199-216 A reconstruction of THABIT IBN QURRA's working in his *De anno solis*.

SUHORUKOV, V I 1974 Vosniknovenie pervykh nachal predmeta metodiki matematiki v Evrope XVI-XVIII vekov [The origins of pedagogy of mathematics in Europe in the XVI - XVII centuries], in *Nekotorye voprosy matematiki i metodiki ee prepodavaniya* Saratov (Saratovskii ped. institut), 35-36
EUCLID's *Elements* do not take into consideration the age peculiarities of young pupils and the practical applications of mathematics. PETRUS RAMUS (1515-1572) and JAN AMOS KOMENSKY (1592-1670) were among the first to mention this didactic drawback. The author considers their contributions to PEDAGOGY. In the XVII century their ideas were developed by JANSENISTS (ANTOINE ARNAULD, PIERRE NICOLAS, BLAISE PASCAL) (B.M. Schein)

SUHORUKOV, V I 1974 Razvitie predmeta metodiki v XVIII veke. A. Klero, S. Lakrua. [The development of PEDAGOGY of mathematics in the XVIII century. A. CLAIRAUT. S.F. LACROIX], in *Nekotorye voprosy matematiki i metodiki ee prepodavaniya* Saratov (Saratovskii ped. institut), 147-171 Clairaut was the first to use the historico-genetic method in developing the school course of mathematics. His textbooks are discussed. Lacroix was the first to consider teaching of mathematics in gymnasiums, lycées and universities. His influence on the teaching of mathematics (especially in RUSSIA) is considered. (B.M. Schein)

MODIANO, Mario S. 1973 How Archimedes stole sun to burn foe's fleet *New York Times* (November 11, 1973), 16 ARCHIMEDES. BURNING MIRRORS. Report of experiment organized by Dr. Ioannis Sakkas [sic. The correct spelling is Sakas -- ed.], a Greek engineer who works for the state power corporation, to test whether a ship could have been set on fire by reflecting the sun's rays from many soldiers' shields. Prof. Evangelos Stamatis, who was present, is reported to have stated that he had no doubt that Archimedes had used the sun to burn the Roman ships.

SAKAS, John [Ionnis] G 1974 *Archimede burned up the Roman fleet by means of flat mirrors. Reproduction in Athens-Piraeus during summer 1973* (Mimeographed) 9 p Copies available from the author: 6 Plateon Str., Vrilissia, Greece. ARCHIMEDES. BURNING MIRRORS. An account of the experiments reported above by Modiano, with diagrams and heat calculations.

BOGOLYUBOV, A N editor 1974 *Fizika na rubezhe XVII-XVIII vv.* [PHYSICS at the turn of the XVII - XVIII centuries] Moscow (Nauka) 247 p ANTHOLOGY. Three translations from English (J Blackwell on the LAWS OF MOTION of DESCARTES, R Kargon on NEWTON, BARROW and hypothetical physics, H Guerlac on Newton and EPICURUS) and five newly published essays (A N Bogolyubov on exact science as a subject in the UNIVERSITIES, V N Pipunirov on CHRONOMETERS, L S Minchenko on Newtonian and Cartesian influences on EULER, P V Boyarskii on the ECOLE POLYTECHNIQUE, E B Modina and Y I Frankfurt on the books' topic) and two BIBLIOGRAPHIES -- Descartes and Newton in Russian.

AYOUB, Raymond 1974 Euler and the Zeta function *Amer. Math. Monthly* 81, 1067-1086 L EULER. INFINITE SERIES. ZETA FUNCTION. A brief biography of Euler and the early history of the zeta function is followed by a discussion of Euler's evaluation of $\zeta(2n)$, first for $n = 1$ and later for n a natural number > 1 . The paper concludes with Euler's discovery in 1749 of the famous functional equation relating the zeta, gamma and cosine functions, a conjecture proved by Reimann in 1859. (*H.S. Tropp*)

CORCORAN, John ed. 1974 *Ancient Logic and Its Modern Interpretations. Proceedings of the Buffalo Symposium on Modernist Interpretations of Ancient Logic, 21-22 April 1972* Dordrecht-Boston (D. Reidel) 221 p. \$29
ARISTOTLE'S LOGIC. STOIC LOGIC. Interesting for, among other things, the explicit effort to use modern logic to elucidate the ancient. There is a final section on future research in ANCIENT SEMANTICS and ANCIENT LOGIC. Selected papers are abstracted below.

KRETZMANN, Norman 1974 Aristotle on spoken sound significant by convention, in Corcoran ed 1974 *Ancient Logic...*, 3-21 ARISTOTLE on SEMANTICS.

MUELLER, Ian 1974 Greek mathematics and Greek logic, in Corcoran ed 1974 *Ancient Logic...*, 35-70 One conclusion is that the LOGIC of EUCLID was independent of ARISTOTLE'S LOGIC and STOIC LOGIC.

MULHERN, John 1974 Modern notations and ancient logic, in Corcoran ed 1974 *Ancient Logic...*, 71-82 ARISTOTLE'S LOGIC. GREEK LOGIC. STOIC LOGIC.

CORCORAN, John 1974 Aristotle's natural deduction system, in Corcoran ed 1974 *Ancient Logic...*, 85-131 ARISTOTLE'S LOGIC.

MULHERN, May 1974 Corcoran on Aristotle's logical theory, in Corcoran ed 1974 *Ancient Logic...*, 133-148 ARISTOTLE'S LOGIC. JAN LUKASIEWICZ.

GOULD, Josiah 1974 Deduction in Stoic logic, in Corcoran ed 1974 *Ancient Logic...*, 151-168 STOIC LOGIC.

CORCORAN, John 1974 Remarks on stoic deduction, in Corcoran ed 1974 *Ancient Logic...*, 169-181 STOIC LOGIC.

CHANDRASEKHAR, S 1974 Development of general relativity *Nature* 252(5478) (1 Nov), 15-17 RELATIVITY. Based on invited lecture at the Amer. Phys. Soc. on occasion of Dannie Heineman Prize for Mathematical Physics.

HENKIN, Leon et al, editors 1974 *Proceedings of the Tarski Symposium. An International Symposium to Honor Alfred Tarski on the Occasion of His Seventieth Birthday* Published for the Association of Symbolic Logic by the American Mathematical Society (Proceeding of Symp Symposia in Pure Mathematics XXV) 518 p. No biography of A TARSKI, but numerous references in the foreword and articles, list of his Ph.D. students, and a complete BIBLIOGRAPHY. Papers are closely related to his work in GENERAL ALGEBRA, FOUNDATIONS, ALGEBRAIC LOGIC, MODEL THEORY, DECISION METHODS, UNDECIDABLE THEORIES, SET THEORY, MEASURE THEORY, LOGIC, DEFINABILITY, ETC. Those of greatest historical interest are abstracted below.

SZMIELEW, Wanda 1974 The role of the PASCH AXIOM in the FOUNDATIONS of EUCLIDEAN GEOMETRY, in Henkin 1974 *Proceedings*, 123-132 BIBLIOGRAPHY.

VAUGHT, R L 1974 MODEL THEORY before 1945, in Henkin 1974 *Proceedings*, 152-172 Survey with BIBLIOGRAPHY.

CHANG, C C 1974 MODEL THEORY 1945-1971, in Henkin 1974 *Proceedings*, 173 Analytic survey with BIBLIOGRAPHY.

BATES, Benson 1974 Austin, Strawson, Tarski, and truth, in Henkin 1974 *Proceedings*, 385-396 Contributions of MAX BLACK, A. TARSKI, J.L.AUSTIN, P.F. STRAWSON, P.T. GEACH, JONATHAN COHEN, etc. to the concept of TRUTH.

POPPER, Karl R 1974 Some philosophical comments on TARSKI's theory of TRUTH, in Henkin 1974 *Proceedings*, 397-409.

SKURATOVSKII, M V 1974 Iz istorii tozhdestva Eilera o prostykh chislakh [From the history of the Euler identity on prime numbers] *Vestnik Kievskogo Politekh-nicheskogo Institute, Seriya Fiz. i Mat.* 1, 70-73 (English summary) The EULER IDENTITY for the WEIERSTRASS ZETA FUNCTION, its development and applications to the SUMMATION OF DIRICHLET SERIES. (B.M. Schein)

NOVY, Lubos & Jaroslav FOLTA 1973 The Fourth International Congress on the History of Science, Prague, 1937 *Acta Historiae Rerum Naturalium Necnon Technicarum, Special Issue* 6, 13-52 MEETINGS. HISTORIOGRAPHY OF SCIENCE. The proceedings of the Fourth International Congress of the History of Science, held in Prague in 1937, were never published because of the death at the hands of the Nazis of the General Secretary of the preparatory committee and the belief that the materials were lost during the war. This special issue of *Acta Historiae* of 388 pages begins with the article abstracted (covering the preparation of the Congress, its activities, efforts to publish Congress materials, and the significance of the Congress to the further development of the history of science and technology to Czechoslovakia) and the first publication of the communications to the Congress (of which those relating to mathematics are abstracted below), and facsimiles of the first page of the second circular for the Fourth Congress, samples from a list of participants, a page of the catalogue of the exposition at the Congress, and some sample pages. This publication fills an important gap in the literature and should be added to all files of proceedings of INTERNATIONAL CONGRESSES.

BIRKENMAJER, Alexander 1973 Les Babyloniens ont-ils connu les logarithmes? [Did the BABYLONIANS know about LOGARITHMS?] (Resume) *Acta hist rer nat nec tech*, Spec 6, 74 (from 4th Int Con HS 1937) The author argues (in opposition to Neugebauer) that an exponential equation in a Babylonian tablet is solved by quite elementary means.

BORTOLOTTI, Ettore 1973 *Mathematica Babilonese* [BABYLONIAN MATHEMATICS] *Acta hist rer nat nec tech*, Spec 6, 83-104 (from 4th Int Con HS 1937) A general discussion on NEUBEGAUER, THUREAU-DANGIN.

BORTOLOTTI, 1973 L'histoire des sciences dans l'enseignement et l'enseignement de l'histoire des sciences [HISTORY OF SCIENCE IN EDUCATION and the teaching of the history of science] *Acta hist rer nat*

nec tech, Spec 6, 105-113 (from 4th Int Con HS 1937)
A plea for more of both in SECONDARY EDUCATION as well as HIGHER EDUCATION.

BORTOLOTTI, Ettore 1973 Interpretazione storica di testi matematici Babilonesi [Historical interpretation of BABYLONIAN MATHEMATICAL TEXTS] *Acta hist rer nat nec tech*, Spec 6, 114-123 (from 4th Int Con HS 1937)
Argues against assuming theoretical knowledge for which there is no direct evidence.

CUPR, Karel 1973 Komenskys unbekannte Handschrift über Geometrie [An unknown manuscript of Komensky on geometry] *Acta hist rer nat nec tech*, Spec 6, 124-132 (from 4th Int Con HS 1937) Describes a previously unknown manuscript of JAN AMOS KOMENSKY (JOANNES AMOS COMENIUS) (XVII) discovered in Leningrad. GEOMETRY. POLAND.

CARRA DE VAUX 1973 La solution Arabe du problème des carrés magiques [The Arabic solution to the problem of MAGIC SQUARES] *Acta hist rer nat nec tech*, Spec 6, 133-140 (from 4th Int Con HS 1937) ARAB MATHEMATICS. GREEK MATHEMATICS. The general method of EL-BOUNI, an Algerian of XIII.

GOODWIN, Astely John Hilary 1973 History of prehistoric archaeology *Acta hist rer nat nec tech*, Spec 6, 158-166 (from 4th Int Con HS 1937) Although there is no mention of mathematics, this may be of interest to those concerned with PREHISTORIC MATHEMATICS in AFRICA.

HOSTINSKÝ, Bohuslav 1973 Notion de force dans la mécanique de 18e siècle [The concept of FORCE in MECHANICS in the XVIII century] *Acta hist rer nat nec tech*, Spec 6, 185-187 (from 4th Int Con HS 1937)

HRUDICKA, Bohuslav 1973 The development of meteorology in Czechoslovakia in the 18th and in the first half of the 19th century (Summary) *Acta hist rer nat nec tech*, Spec 6, 188-189 (from 4th Int Con HS 1937) XVIII.
XIX. CZECHOSLOVAKIA. METEOROLOGY.

JELITAI, Jozsef 1973 Zur Geschichte der Mathematik in Ungarn vor 1830 [On the history of mathematics in HUNGARY before 1830] *Acta hist rer nat nec tech*, Spec 6, 199-206 (from 4th Int Con HS 1937) From 1499 to the first of the elder BOLYAI in 1830.

KADERAVEK, Frantisek 1973 Daniel Schwenter - Theophilus Schweighart (Summary) *Acta hist rer nat nec tech*, Spec 6, 207 (from 4th Int Con HS 1937) Describes a book entitled *Pandora sextae aetatis* by DANIEL SCHWENTER (1585-1636) writing under the pseudonym THEOPHIL SCHWEIGHART CONSTANS.

LORIA, Gino 1973 A la recherche d'une frontière [Search for a frontier] (Resume) *Acta hist rer nat nec tech*, Spec 6, 216 (from 4th Int Con HS 1937) The boundary between arithmetic and algebra, specified so that there was no ALGEBRA in ANCIENT times.

SALTYKOV, Nicolas 1973 L'oeuvre de Descartes *La Géométrie* a l'occasion des 300 ans du *Discours de la Méthode* [DESCARTES' *Geometry* on the 300th anniversary of his *Discourse on Method*] (Resume) *Acta hist rer nat nec tech*, Spec 6, 287-288 (from 4th Int Con HS 1937)

SERGESCU, Pierre 1973 *Le Journal des Savants* au début du XVIIIe siècle et les mathématiques (1702-1723) [The *Journal des Savants* and mathematics at the beginning of the XVIII century] *Acta hist rer nat nec tech*, Spec 6, 308-309 (from 4th Int Con HS 1937) FRANCE. SERIALS.

LAI, Tyrone 1973 Nicholas and the finite universe
J. History Philosophy 11, 161-167 COSMOLOGY.
INFINITY. Argues that N CUSANUS considered the world
finite in extent.

CAPEK, Milic 1973 Time *Dictionary of the History of
Ideas* 4, 389-398 Mainly philosophicas aspects of
TIME.

KOCH, R J 1973 A theorem a day *Rev. Roumaine Math.
Pures Appl.* 17, 879-883 A D WALLACE. TOPOLOGICAL
SEMIGROUPS. BIBLIOGRAPHY (1952-1969) (MR 47 #3137)

BOCHNER, Salomon 1973 Mathematics in cultural history
Dictionary of the History of Ideas 3, 177-185
CULTURAL HISTORY OF MATHEMATICS. HISTORIOGRAPHY.
MATHEMATICS AND SOCIETY. Discusses in broad terms
HISTORICAL PROBLEMS of ANCIENT, GREEK, MEDIEVAL,
RENAISSANCE, XVII, XVIII, and XIX century mathematics.

MITROPOLSKII, Yu O & V M KOSHLIYAKOV & O P BOYCHUK &
V M KALINOVICH 1973 Pro roboti z teorii giroskopiv
v Institute matematiki AN URSR [Work on the theory of
GYROSCOPES in the Mathematical Institute of the
Academy of Sciences of the Ukrainian Soviet Socialist
Republic] *Ukrainskii matematicheskii zhurnal* 25,
742-755 (Ukrainian edition); 747-760 (Russian edition)
GEOMETRY and KINEMATICS of GYROSCOPIC SYSTEMS; complex
gyroscopic systems; INERTIAL NAVIGATION. A survey of
work in the MATHEMATICAL INSTITUTE OF THE UKRAINIAN
ACADEMY OF SCIENCES. (B.M. Schein)

BECHLER, Zev 1973 Newton's search for a mechanistic
model of colour dispersion: a suggested interpretation
Arch. History Exact Sci. 11(1), 1-37 MODELS IN
SCIENCE. I NEWTON. OPTICS.

WILDER, Raymond L 1973 Relativity of standards of
mathematical rigor *Dictionary of the History of Ideas*
3, 170-177 AXIOMATICS. PROOF. RIGOR.

COLIE, Rosalie 1973 Literary paradox *Dictionary of
the History of Ideas* 3, 76-81 PARADOXES.

SIRAIISI, Nancy G 1973 *Arts and Sciences at Padua. The Studium of Padua before 1350* (Studies and Texts #25) Toronto (Pontifical Institute of Mediaeval Studies) 199 p PADUA. UNIVERSITIES. XIII. XIV. Detailed analysis of the evidence. Of five chapters two are on the TRIVIVM (Grammar, Rhetoric, and LOGIC) and on the QUADRIVIVM (ARITHMETIC, GEOMETRY, ASTRONOMY, MUSIC). BIBLIOGRAPHY.

AKHIEZER, N I et al. 1973 Mikhail Grigor'evich Khaplanov (on his seventieth birthday) *Russian Math. Surveys* 28(3), 141-146 BIBLIOGRAPHY. COMPLEX ANALYSIS. DIFFERENTIAL EQUATIONS. M G KHAPLANOV. SPACES OF ANALYTIC FUNCTIONS. (D.E. Kullman)

HOFFMANN, Banesh 1973 *Relativity Dictionary of the History of Ideas* 4, 74-92 RELATIVITY and its early precursors in ancient times.

VOGEL, Kurt 1973 Francesco Balducci Pegolotti als Mathematiker (ca. 1290-1347) *Deutsches Museum Abh. u. Ber.* 41(1), 8-18 ARITHMETIC. BUSINESS MATHEMATICS. INTEREST TABLES. F B PEGOLOTTI.

ANON 1973 Obituary: Theodore Samuel Motzkin, Professor of Mathematics (1908-1970) *J. Combinatorial Theory* (A)14, 271-272 T S MOTZKIN. (MR 46 #3141)

SHUKLA, Kripa Shankar 1973 Use of hypotenuse in the computation of the equation of the centre under the epicyclic theory in the school of Aryabhata I??? *Indian Journal of History of Science* 8(1-2), 43-57 Argues that the followers of ARYABHATA I did not use the hypotenuse in computation of the equation of the centre in EPICYCLIC THEORY.

WEINBERG, Julius 1973 Abstraction in the formation of concepts *Dictionary of the History of Ideas* 1, 1-9 ABSTRACTION.

BOCHNER, Salomon 1973 *Space Dictionary of the History of Ideas* 4, 295-306 GEOMETRY. SPACE.

BOCHNER, Salomon 1973 *Infinity Dictionary of the History of Ideas* 2, 604-617 INFINITY.

MERTON, Robert K 1973 *The Sociology of Science. Theoretical and Empirical Investigations* Chicago & London (Univ of Chicago Press) 636 p Selected works of R K MERTON, father of SOCIOLOGY OF SCIENCE, edited with an introduction by N W Storer and bibliography. Topical index (virtually a glossary of the field). Name index (a near who's who of science, including 75 mathematicians). Examples from mathematics, but little discussion of mathematics policy or sociology of mathematics in particular.

SHEYNIN, O B 1973 Mathematical treatment of astronomical observations (A historical essay) *Arch. History Exact Sci.* 11(2/3), 97-126 ASTRONOMY. ERROR THEORY. ESTIMATION. EXPERIMENTAL DESIGN. LEAST SQUARES. STATISTICS. STATISTICAL DATA. Many references to primary sources from Ptolemy to Gauss and to the secondary literature.

HARR, James 1973 Pythagorean harmony of the universe *Dictionary of the History of Ideas* 4, 38-42 COSMOLOGY. MUSIC. PYTHAGORAS.

VOLKOVA, V O 1973 Georgii Vasilovich Pfeifer (Do 100-richchya vid dnya narodzhennya) [GEORGII VASILEVICH PFEIFER. (On the 100th anniversary of his birthday)] (Ukrainian with Russian and English summaries) *visnik Kiivsogo Univ. Ser. mat. ta mekh.* 15, 137-141, 147 (B.M. Schein)

ELLEGARD, Alvar 1973 Study of linguistics *Dictionary of the History of Ideas* 2, 659-673 LINGUISTICS.

BENZ, Walter 1973 *Vorlesungen über Geometrie der Algebren. Geometrien von Möbius, Laguerre-Lie, Minkowski in einheitlicher und grundlagengeometrischer Behandlung* [Lectures on geometry of algebras. The GEOMETRIES of A F MOBIUS, E LAGUERRE - M S LIE, H MINKOWSKI treated in a unified and geometrically fundamental way] (Springer Verlag) 379 p ALGEBRAIC GEOMETRY.

BUNGE, Mario ed 1973 *The Methodological Unity of Science* Dortrecht-Boston (D. Reidel) 272 p \$30
An ANTHOLOGY on PHILOSOPHY OF SCIENCE, including essays on PHILOSOPHY OF MATHEMATICS (under the heading "formal science") abstracted individually below.

BUNGE, Mario 1973 Bertrand Russell's *regulae philosophandi*, in Bunge ed 1973 *The Methodological...*, 3-12 The first sentence is "It is well known that BERTRAND RUSSELL was not a single person but a whole sequence of scholars."

CASTONGUAY, Charles 1973 Mathematics and ontology, in Bunge ed 1973 *The Methodological...*, 15-22
EXISTENCE. PHILOSOPHY OF MATHEMATICS.

CORCORAN, John 1973 Gaps between logical theory and mathematical practice, in Bunge ed 1973 *The Methodological...*, 23-50 LOGIC. PHILOSOPHY OF MATHEMATICS. PLATONISM.

ANGEL, Roger B 1973 Relativity and covariance, in Bunge ed 1973 *The Methodological...*, 53-68 RELATIVITY. COVARIANCE.

BUNGE, Mario 1973 On confusing 'measure' with 'measurement' in the methodology of behavioral science, in Bunge ed 1973 *The Methodological...*, 105-122
MEASURE THOERY. MEASUREMENT. METROLOGY.

LEINFELLNER, Werner 1973 Historical time and a new conception of the historical sciences, in Bunge ed 1973 *The Methodological...*, 193-215 HISTORIOGRAPHY.

REICH, Karin 1973 Die Geschichte der Differential-geometrie von Gauss bis Riemann (1828-1868) [History of DIFFERENTIAL GEOMETRY from C F GAUSS to B RIEMANN] *Arch. History Exact Sci.* 11(4), 273-382 BIBLIOGRAPHY of primary sources (over 600 references, including a biographical reference for each author), in addition to footnote references and a subject and a person index.

SPEZIALI, P 1973 Luca Pacioli et son oeuvre, in *Sciences de la Renaissance, VIII Congrès international de Tours (De Petrarque à Descartes XXVII)* Paris (Lib. Philosophique J. Vrin), 93-106 L PACIOLI.

SPEZIALI, P 1973 L'école algebriste italienne de XVI siècle et la résolution des équations des 3^e et 4^e degrés, in *Sciences de la Renaissance, VIII Congrès international de Tours*, 93-106 BOLOGNA. CUBIC EQUATIONS. ITALY. QUARTIC EQUATIONS. XVI.

LEE KONG CHIAN INSTITUTE OF MATHEMATICS 1973
Directory of Mathematical Facilities in Southeast Asia Singapore (Southeast Asian Mathematical Society, Dept Math, Nanyang Univ, Singapore 22) 42 p Alphabetical lists of journals and films with library holdings.

LEE KONG CHIAN INSTITUTE OF MATHEMATICS 1973
Directory of Mathematicians in Southeast Asia Singapore (Southeast Asian Mathematical Society, Dept Math, Nanyang Univ, Singapore 22) 39 p Gives officers of the SAMS, a list of mathematicians in Hong Kong, Indonesia, Malaysia, Philippines, Singapore, Thailand, and South Vietnam with specialties, topical and geographical indexes.

BOCHNER, Salomon 1973 Symmetry and asymmetry
Dictionary of the History of Ideas 4, 345-353
Includes mathematical and broader aspects of SYMMETRY.

HOENIGSWALD, Henry M 1973 *Linguistics Dictionary of the History of Ideas* 3, 61-72 LINGUISTICS.

BOGOLYUBOV, N N and others 1973 Vasilii Sergeevich Vladimirov (on his fiftieth birthday) *Differentsialnye Uravneniya* 9, 389-391 V S VLADIMIROV. SEVERAL COMPLEX VARIABLES. LAPLACE TRANSFORMS OF DISTRIBUTIONS. QUANTUM THEORY. (MR47 #3135)

MARACCHIA, Silvio 1973 Sulle fonti della matematica greca *Cultura e scuola* (47), 235-253 GREEK MATHEMATICS.

JAIN, L C 1973 Set theory in Jaina School of Mathematics *Indian Journal of History of Science* 8(1-2), 1-27 HINDU MATHEMATICS. INDIAN MATHEMATICS. JAINA MATHEMATICS. SETS.

BOCHNER, Salomon 1973 Continuity and discontinuity in nature and knowledge *Dictionary of the History of Ideas* 1, 492-504 Section IV is on CONTINUITY in mathematics, VII on HISTORIOGRAPHY.

MATVIISHIN, Ya A 1973 Geliocentricheskaya sistema mira Kopernika v izlozhenii Feofana Prokopovicha [The heliocentric system of the world of Copernicus as exposed by Feofan Prokopovich] *Dinamicheskie sistemy i voprosy ustoichivosti reshenii differentsialnykh uravnenii* Kiev pp. 4-20 Popularizations of the achievements of COPERNICUS, GALILEO, TYCHO BRAHE, KEPLER, DESCARTES, HUYGENS by F PROKOPOVICH (XVIII). (B.M. Schein)

VARTANIAN, Aram 1973 Man-machine from the Greeks to the computer *Dictionary of the History of Ideas* 3, 131-140 COMPUTERS. MACHINES.

COLLETTE, Jean-Paul 1973 *Histoire des mathématiques* Montreal (Ed. du Renouveau Pédagogiques) 228 p. A TEXTBOOK IN HISTORY OF MATHEMATICS from prehistorical times to the XVII century, based on a course for teacher training. Summaries, discussion questions, projects, and bibliographies.

RUESTOW, Edward G 1973 *Physics at Seventeenth and Eighteenth Century Leiden: Philosophy and the New Science in the University* (International Archives of the History of Ideas, Series Minor 11) The Hague (Martinus Nijhoff) 174 p Gld 24.50 LEIDEN. PHYSICS. XVII. XVIII. References to the role of mathematics are well-indexed. Bibliography (14 p).

SPEZIALI, Pierre 1973 Classification of the sciences *Dictionary of the History of Ideas* 1, 462-467 Makes evident the ROLE OF MATHEMATICS in culture and in CLASSIFICATION.

NOESIS 1973- Proceedings of the Romanian Committee for the History and Philosophy of Science of the Academy of the Socialist Republic of Romania. Vol. 1 collects the papers given at the Colloquium on History and Philosophy of Science at Bucharest in April-May 1972, Vol. 2 the colloquium organized by the Committee in November 1972, Vol. 3 the colloquium of July 1973. Papers relating to mathematics in Vol. 1 are abstracted below.

NICOLESCU, Miron 1973 Les entités abstraites en mathématiques [Abstract entities in mathematics] *Noesis* 1, 11-18 ABSTRACTION. PHILOSOPHY OF MATHEMATICS.

TELEMAAN, Silviu 1973 Aperçu sur le développement de l'analyse fonctionnelle en Roumanie [Sketch of the development of FUNCTIONAL ANALYSIS in ROUMANIA] *Noesis* 1, 261-271

MARCUS, Solomon 1973 Cinq states de développement de la théorie des fonctions réelles en Roumanie [Five stages in the development of REAL ANALYSIS in ROMANIA] *Noesis* 1, 299-306

BOBOC, Nicu 1973 Contribution de l'école roumaine de mathématiques à la théorie du potentiel [Contributions of the ROMANIAN school to POTENTIAL THEORY] *Noesis* 1, 307-310

TEODORESCU, N & I VADUVA 1973 Les principales étapes dans l'évolution de l'informatique en Roumanie [Main stages in the evolution of informatics in ROMANIA] *Noesis* 1, 311-321 COMPUTERS. CYBERNETICS. INFORMATION THEORY. LINGUISTICS.

MIHOC, Gh 1973 Probability, mathematical statistics, operational research *Noesis* 1, 323 ERGODIC THEORY. MEASURE THEORY. OPERATIONAL RESEARCH. PROBABILITY. ROMANIA. STATISTICS.

ONICESCU, Octav 1973 Mathématiques de demain [Tomorrow's mathematics] *Noesis* 1, 331-340 CURRENT HISTORY. FUTUROLOGY. PURE AND APPLIED MATHEMATICS. ROLE OF MATHEMATICS.

Materialien zur Analyse der Berufspraxis des Mathematikers (M. z. *Berufspraxis Math.*) Published by the Projektgruppe "Mathematik in der Industriegesellschaft" of the Fakultät für Mathematik, Universität Bielefeld. Numbers 1-13, 1971-1975 CURRENT HISTORY. EDUCATION. MATHEMATICS POLICY. SOCIOLOGY OF MATHEMATICS. Historical articles are abstracted below. The first two numbers describe plane and approaches.

BOOS, Bernhelm 1972 Die historische Entwicklung mathematischer Tätigkeit [The historical development of mathematical activity] *M. z. Berufspraxis Math.* (5), 1-44 GROWTH OF MATHEMATICS. HISTORICAL THEORY. MATHEMATICS AND SOCIETY. NATURE OF MATHEMATICS. PHILOSOPHY OF MATHEMATICS. ROLE OF MATHEMATICS.

KUCHLER, Manfred 1973 Formalisierung in den Sozialwissenschaften. Eine kommentierte bibliographie [Formalization in the SOCIAL SCIENCES. An annotated BIBLIOGRAPHY] *M. z. Berufspraxis Math.* (10), 46-83 APPLICATIONS. MATHEMATIZATION.

LIEFLANDER, Gerd & SCHMIDT, Hans Albrecht 1973 Informatik und Gesellschaft: Ausbildung und Berufsbild; Ergebnisse eines Proseminars [INFORMATION SCIENCE and society: EDUCATION and professional training; report of a seminar] *M. z. Berufspraxis Math.* (13), 1-194

BOGOLYUBOV, A N 1973 *Georgii Nikolaevich Nikoladze* (1888-1931) Moscow ("Nauka") 166 p G N NIKOLADZE. ALGEBRAIC GEOMETRY. GEORGIAN S S R. A popular scientific and social BIOGRAPHY of this Georgian engineer-blast furnace worker and mathematician BIBLIOGRAPHY.

FERRAR, W L 1973 Autobiographical *Eureka* 36, 11-14 W L FERRAR. OXFORD UNIVERSITY. REMINISCENCES, 1912-1971 (*Underwood Dudley*)

KONDRAT'EV, K Ya et. al. 1973 Yurii Aleksandrovich Surinov (on his sixteenth birthday) *Russian Math. Surveys* 28 (6), 105-106 Y A SURINOV. APPLIED MATHEMATICS. BIOGRAPHY. TRANSFER OF RADIATION. (*D.E. Kullman*)

CAPOCACCIA, A Agostino 1973- *Storia della tecnica* [History of TECHNOLOGY] Turin (Unione Tipografico-Editrice Torinese) 4 volumes (from prehistory to X; from X to the Renaissance; from XVI to XIX; contemporary) will be abstracted separately.

MONDINO, Alberto 1973 *Storia della tecnica. Volume primo. Dalla preistoria all'anno mille* [History of technology 1. From PREHISTORY to the year 1000] Introduction by A. Agostino Capocaccia (editor of the 4 volumes) Turin (Unione Tipografico-Editrice Torinese) 437 p Richly illustrated. Includes Islamic civilization but not the Far East, and like other histories of TECHNOLOGY, ignores mathematical technology, in particular the crucial technologies of numeration and calculation.

FORTI, Umberto 1974 *Storia della tecnica. Volume secondo. Dalla rinascita dopo il mille all'fine del Rinascimento* [History of technology 2. From the post-X revival to the end of the Renaissance] Turin (Unione Tipografico-Editrice Torinese) 461 p Unlike most historians of technology, Professor Forti takes account of MATHEMATICAL TECHNOLOGY and RENAISSANCE periods, including NAVIGATION, BUSINESS MATHEMATICS, CALCULATIONS (especially LOGARITHMS), and MATHEMATICAL INSTRUMENTS.

BLIZNIKAS, B J et. al. 1973 Kleopas Iokimovich Grintsevichyus *Russian Math. Surveys* 28(3), 133-139 K I GRINTSEVICHYUS. BIBLIOGRAPHY. OBITUARY. GEOMETRY OF COMPLEXES AND HYPERCOMPLEXES. NON-HOLOMORPHIC GEOMETRY. RULED MANIFOLDS. (D.E. Kullman)

NEUMANN, B H 1973 Byron's daughter *Math. Gaz.* 57, 94-97 LADY LOVELACE (ADA BYRON). CHARLES BABBAGE. Brief sketch based on unpublished CORRESPONDENCE.

ONG, Walter J 1973 Ramism *Dictionary of the History of Ideas* 4, 42-45 LOGIC. P RAMUS. XVI.

ERUGIN, N P and others 1973 Lev Dmitrievich Kudryavchev (on his fiftieth birthday) *Differentsialnye Uravneniya* 9, 969-973 L D KUDRYAVCHEV. BIBLIOGRAPHY (1946-72).

CHERKAVSKII, V G 1973 Issledovaniya S.A. Chaplygina po priblizhennomu resheniyu differentsialnykh uravnenii [Investigations of S A CHAPLYGIN on the APPROXIMATE SOLUTION OF DIFFERENTIAL EQUATIONS] *vychislitel'naya matematika*, Kiev, 43-48 (B.M. Schein)

SHAPIRO, Alan E 1973 Kinematic optics: A study of the wave theory of light in the seventeenth century *Arch. Hist. Exact Sci.* 11(2/3), 134-266 LIGHT. OPTICS. WAVE THEORY.

MIHKLIN, S G 1973 The spectrum of a family of operators in the theory of elasticity *Russian Math. Surveys* 28(3), 45-48 BIBLIOGRAPHY. COSSERAT SPECTRUM. ELASTICITY. The work of EUGENE and FRANCOIS COSSERAT from 1898 to 1901 is explained and shown to be the precursor of modern SPECTRAL THEORY OF OPERATORS. (D.E. Kullman)

BLANCHE, Robert 1973 Axiomatization *Dictionary of the History of Ideas* 1, 162-172 AXIOMATICS in science in general and mathematics in particular.

LEIBNIZ, G W 1973 *Marginalia in Newtoni Principia Mathematica* (1687) [Marginal notes in Newton's *Principia Mathematica*] Edited by E.A. Fellmann with an *avertissement* by Pierre Costabel. Collection des travaux de l'Académie internationale d'histoire des sciences no. 18 Paris (J. Vrin) 126 p Facsimile and transcription (in original Latin) of 24 pages with marginal notes in the G W LEIBNIZ copy of the *Principia* of ISAAC NEWTON with editorial matter and description of marked and underlined passages (in German with French translation).

PEJ CZYNSKI, A 1973 On some problems of Banach *Russian Math. Surveys* 28(6), 67-76 BIBLIOGRAPHY. FAMOUS PROBLEMS. A progress report, with historical notes, issued on the 40th anniversary of S BANACH's famous monograph on NORMED LINEAR SPACES. Concerns: (1) the APPROXIMATION PROBLEM and the BASIS PROBLEM; (2) the problems of a metric and linear topological characterization of HILBERT SPACES in the class of all BANACH SPACES. (D.E. Kullman)

PALISCA, Claude 1973 Music and science *Dictionary of the History of Ideas* 3, 260-264 MUSIC. MUSIC SCALES.

BOCKSTAELE, P 1973 Bibliografie van de Geschiedenis der Wetenschappen in Benelux XXVII [BIBLIOGRAPHY of the history of science in Benelux] *Mededelingen uit het Seminarie voor Geschiedenis van de Wiskunde en de Universiteit te Leuven* [Communications from the seminar in the history of science at the University of Louvain], *Scientiarum Historia* (3), 172-201 Mainly works from 1972-1973 published in or by scholars from Belgium, Netherlands, or Luxembourg.

GUPTA, Radha C 1973 The Madhava-Gregory series (Glimpses of Ancient Indian Math. no. 7) *The Mathematics Education* 7(3), 67-70 GREGORY SERIES. INDIAN MATHEMATICS. MADHAVA OF SANGAMAGRAMA (XIV-XV). TANGENT FUNCTION.

PONT, Jean-Claude 1973 *La topologie algébrique des origines à Poincaré* [ALGEBRAIC TOPOLOGY from its origins to Poincaré] With a preface by René Taton Paris (Presses Universitaires de France) 197 p
ANALYSIS SITUS. COMBINATORIAL TOPOLOGY. EULER POLYHEDRON THEOREM. E BETTI. G CANTOR. A L CAUCHY. W VON DYCK. L EULER. K F GAUSS. C JORDAN. F KLEIN. A M LEGENDRE. G LEIBNIZ. S L'HUILIER. J B LISTING. A F MOBIUS. J E MULLER. C NEUMANN. H POINCARÉ. B RIEMANN. GH VON STAUDT. G WEICHOLD. A postscript pleads for HISTORY OF MATHEMATICS IN EDUCATION and stresses the relations between mathematics and the arts. There is a chronology from 1679 to 1890, a diagram showing relations of persons by arrows, biographical notes, bibliography (10 p) and both topical and name indexes.

LEWIS, Albert C 1973 Halsted's translation of Lobachevskii's Theory of Parallels *Texas Quarterly* (Autumn), 85-98 NON-EUCLIDEAN GEOMETRY. Reprint of G B HALSTED's preface, introduction and appendix to his translation *Geometrical Researches on the Theory of Parallels* (Austin 1891) by N I LOBACHEVSKII, preceded by a biobibliographic note.

MORGENSTERN, Oskar 1973 Game theory *Dictionary of the History of Ideas* 2, 263-275 GAME THEORY. PROBABILITY.

NEUENSCHWANDER, E 1973 Beiträge zur Frühgeschichte der griechischen Geometrie I [Essay on the early history of GREEK GEOMETRY I] *Arch. History Exact Sci.* 11(2/3), 127-133 EQUIVALENCE BY DECOMPOSITION. TRIANGLE AREA. TRIANGLE ANGLE SUM.

JOLY, Jean-Rene 1973 Equations et variétés algébriques sur un corps fini [Equations and ALGEBRAIC VARIETIES on a FINITE FIELD] *L'Enseignement Math.* 19, 1-117 ALGEBRAIC NUMBER THEORY. BIBLIOGRAPHY. CHEVALLEY'S THEOREM. DIAGONAL EQUATIONS. RIEMANN HYPOTHESIS IN CHARACTERISTIC P. ZETA FUNCTIONS. A survey of the classical DIOPHANTINE PROPERTIES of finite fields. (D.E. Kullman)

RONCHI, Vasco 1973 Optics and vision *Dictionary of the History of Ideas* 3, 407-421 OPTICS.

SPADE, Paul V 1973 The origins of the mediaeval insolubilia literature *Studies* 33, 292-309 MEDIEVAL LOGIC. PARADOXES.

ILTIS, Carolyn et al. 1973 *Women Historians of Science* Report of the Committee on Women in the History of Science Typescript mimeographed, 25 p. Presents data on DISCRIMINATION in the U.S. and Canada. The committee includes the historian of mathematics Judith Grabiner. A DIRECTORY of WOMEN in the field is available from the chairwoman, Prof. Carolyn Iltis, Collegiate Seminar Program, University of California, Berkeley, California 94720.

WHITROW, G J 1973 Time and measurement *Dictionary of the History of Ideas* 4, 398-406 Mathematical, physical and other aspects of TIME.

KNUTH, Donald E 1973 Computer science and mathematics *American Scientist* 61, 707-713 COMPUTER SCIENCE. CURRENT HISTORY. NATURE OF MATHEMATICS. Subtitle: How a new discipline presently interacts with an old one, and what we may expect in the future. Bibliography.

SUGA, Genzo 1973 "Kuku" of a mnemonic system for multiplication in Japan (in Japanese) *J. Hist. Math. Japan* (59), 58-64 CHINESE MATHEMATICS. MULTIPLICATION and DIVISION in WASAN (JAPANESE MATHEMATICS) and other Chinese and Japanese literature relating to the SWANBAN (CHINESE ABACUS). (Katsuhiko Yoshida)

GEIRINGER, Hilda 1973 Probability: objective theory *Dictionary of the History of Ideas* 3, 605-623 Survey of the history of PROBABILITY.

BORODIN, A I & A S BUGAI 1973 *Biograficheskii slovar deyatelei v oblasti matematiki* [BIOGRAPHICAL DICTIONARY of mathematicians] Kiev (Radyanska Shkola) 551 p (in Ukrainian) PORTRAITS. (B.M. Schein)

MONNA, A F 1973 *Functional Analysis in Historical Perspective* Utrecht (Oosthoek) 167 p A sketch emphasizing the sources of FUNCTIONAL ANALYSIS in XIX (86 p) in PHYSICS (via infinite systems of LINEAR EQUATIONS and INTEGRAL EQUATIONS) and PROBABILITY (via the PROBLEM OF MOMENTS), LINEAR SPACES (35 p), GENERAL ANALYSIS (13 p) and selected "characteristic topics" (9 p). Final remarks on general tendencies (2 p), appendix of translations of quotations in the text (5 p), bibliography of 147 items, topical index.

SCRIBA, C J 1973 *Number Dictionary of the History of Ideas* 3, 399-407 NUMBER CONCEPT. NUMERATION.

DALES, Richard C 1973 *The Scientific Achievement of the Middle Ages* Univ Pennsylvania Press 191 p \$3.45 ADELARD OF BATH. ROBERT GROSSETESTE. KINEMATICS. NICOLE ORESME. RAINBOW. THOMAS OF BRADWARDINE. SOURCE BOOK of medieval science with a historical narrative, some evaluation, and a bibliographic essay.

LEWIN, C G 1973 The philosophers' game *Games and Puzzles* 16, 14-19 Comprehensive rules of the medieval mathematical game of ARITHMOMACHIA, with BIBLIOGRAPHY. (Author abstract)

HOVLE, Fred 1972 *From Stonehenge to Modern Cosmology* San Francisco (W.H. Freeman) 100 p ASTRONOMY. CALCULATING INSTRUMENTS. INSTRUMENTS. The second of four lectures (pp. 19-54) argues that STONEHENGE was an astronomical observatory some parts of which go back nearly 5000 years.

MITROPOLSKII, Yu O and I Z SHTOKALO & O M BOGOLYUBOV & A Yu LUCHKA & V S SOLOGUB 1972 Jurii Dmitrievich Sokolov *Narisi z ist. prirod. i tekhn. Respub. Mizhvidomstvennii Zhirnik* 17, 86-88 J D SOKOLOV. OBITUARY. (in Ukrainian) (B.M. Schein)

VINCENSINI, P 1972 La géométrie différentielle aux XIX^e siècle (avec quelques réflexions générales sur les mathématiques) [DIFFERENTIAL GEOMETRY in the XIX century] *Scientia* 107, 617-696 (including English trans.) A usefully wide-ranging survey, taking in CURVATURE, GEODESICS, SURFACE DEFORMATION and other topics on its course through historical space. The work of GAUSS, BONNET, DARBOUX and several other mathematicians is treated. (I. Grattan-Guinness)

ANON 1972 Nikolai Ivanovich Muskhelishvili (on his eightieth birthday) *Russian Math. Surveys* 27(4), 1-19 N I MUSKHELISHVILI. BIOGRAPHY. ANALYTIC FUNCTION THEORY. ELASTICITY. INTEGRAL EQUATIONS. (D.E. Kullman)

UNITED STATES DEPT OF COMMERCE 1972 *Brief History of Measurement Systems* Washington, D.C. (U.S. Government Printing Office; Special Publication 304A) METROLOGY. METRIC SYSTEM.

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LAPKO, A F 1972 The development of higher education in the U.S.S.R. during the first three five-year plans *Russian Math. Surveys* 27(6), 3-23 HIGHER EDUCATION. MATHEMATICS EDUCATION. USSR. XX. The reorganization of higher education from 1928 until the Second World War is discussed, with emphasis on the technical schools, curriculum, manpower, and mathematical literature. (D.E. Kullman)

BARNES, Barry ed. 1972 *Sociology of Science: Selected Readings* (Penguin Modern Sociology Readings) CHINESE MATHEMATICS. ROLE OF MATHEMATICS. SCIENTIFIC REVOLUTION. SOCIOLOGY OF SCIENCE. A fairly wide ranging anthology arranged in six parts: The emergence and institutionalization of modern science; Structural and cultural features of contemporary pure science; Science in application: Links with technology and economy; Science and political institutions; Science in society: Problems of intelligibility and impact; and Scientific concepts and the nature of society. Reprints many writings of well known authors from Thorstein Veblen's "Idle curiosity in society" (1906) to several papers originally written in 1971. Except for the first paper (Joseph Needham, 1956, "Mathematics and science in China and the West," *Science and Society* 20, 320-343), mathematics gets scant attention, as is still unfortunately customary among sociologists of science, and no mention at all in the index. Substantial BIBLIOGRAPHIES.

VASILEVA, N L 1972 Istoriya razvitiya metoda uravneni [A history of the development of the theory of equations] *Prepodavanie mat. v sredn. shkole* (Sbornik), Leningrad, 215-237 ALGEBRAIC NUMBERS. DIOPHANTINE EQUATIONS. GROUPS. LINEAR SYSTEMS OF EQUATIONS. A sketch of the development of the THEORY OF EQUATIONS from antiquity to the present, particularly emphasizing its role in the development of other branches of mathematics. [RZ 1973 #3A14] (Helen Skala)

ELZINGA, Aant 1972 *On a Research Program in Early Modern Physics* Göteborg (Akademiförlaget) 144 p. R DESCARTES. The research program is that of C HUYGENS in MECHANICS, which the author relates to R DESCARTES, GALILEO, ARISTOTLE, SCHOLASTICISM, HISTORICAL THEORY, and PHILOSOPHY OF SCIENCE.

TOTH, Imre 1972 *Die nicht-euklidische Geometrie in der Phänomenologie des Geistes. Wissenschaftstheoretische Betrachtungen zur Entwicklungsgeschichte der Mathematik* [NON-EUCLIDEAN GEOMETRY in the phenomenology of the spirit. Scientific-theoretical observations on the development of mathematics] Frankfurt (Horst Heiderhoff) 91 p (Also in vol. 2 of *Philosophie als Beziehungswissenschaft. Festschrift für Julius Schaaf*, same year and publisher) GEOMETRY FOUNDATIONS. HISTORICAL THEORY. IDEALISM. NATURE OF MATHEMATICS. PHILOSOPHY OF MATHEMATICS. PLATONISM. A 33-page essay with a 4-page introduction and 50 pages of notes. The central theme is that mathematics is not a natural science.

GRINBERG, E Ya and others 1972 A survey of the fundamental works of E.I. Arin (E. Arins) in mathematics and cybernetics *Latvian Mathematical Yearbook* 11, 220-224 Riga (Izd. Zinatne) (Russian with English summary) Preceded by an anonymous biography 219-220 (MR 47 #3139, #3140) CYBERNETICS.

BOLZAN, J 1972 Un antiguo antecedente del calculo de probabilidades [An ANCIENT precursor of probability theory] *Scientia* 107, 873-878 (including English trans.) GREEK MATHEMATICS. THUCYDIDES' account of the use of PROBABILITY in the Peloponnesian War. If the interpretation is correct, we must add a nice morsel to the history of applied mathematics. (I. Grattan-Guinness)

EGANYAN, A M 1972 *Grecheskaya logistika* [GREEK LOGISTIC] Erevan, Armenia (Izd. Aiastan) 308 p Reexamines primary and secondary sources. Following Plato's classification, argues that practical arithmetic and practical logic preceded their theoretical counterparts, and that theoretical logistic was the Greek algebra. Translations of primary sources (57 p) and a BIBLIOGRAPHY (301 items).

SCRIBA, Christoph J 1972 Die Geschichte der Naturwissenschaften im Spiegel des XIII. International Kongresses in Moskau TUB (*Zeitschrift der Technischen Universität Berlin*) 6, 535-546 CONTEMPORARY HISTORIOGRAPHY. HISTORY OF HISTORIOGRAPHY OF SCIENCE. MEETINGS. MOSCOW INSTITUTE FOR HISTORY OF SCIENCE AND TECHNOLOGY.

ALEKSANDROV, P S 1972 Poincaré and topology *Russian Math. Surveys* 27(1), 157-168 DIMENSION THEORY. HOMOLOGY. HOMOTOPY. TOPOLOGICAL MANIFOLDS. Describes H POINCARÉ's views on TOPOLOGY, his contributions to its early development, and related topological work of his contemporaries. A 1911 letter of Poincaré to L E J BROUWER is published, with commentary by V.K. Zorin. (D.E. Kullman)

LUEBBERT, W F 1972 *Information Systems Heritage. Multi-Image Presentations* I. Prehistory (11 min.) II. The false dawn -- Charles Babbage and his calculating machines (25 min.) III. Those magnificent men and their punch card machines Part 1. The 19th century -- The Billings/Hollerith era (13 min.) Part 2. Through World War I -- The Hollerith era (26 min.) Part 3. The Watson era (24 min.) (West Point) C BABBAGE. J S BILLINGS. H HOLLERITH. T WATSON. CALCULATING MACHINES. COMPUTERS. INFORMATION SYSTEMS. NUMERATION. PUNCH CARD MACHINES. These are multi-image, multi-screen presentations, using motion pictures, slides, music and narration. The author plans to convert them to simple slide-sound presentations, which can be run with merely a cassette tape recorder and slide projector. Other presentations on Pascal's and Leibniz's calculators are in preparation.

BOISSIERE, Claude de 1972 *Art poetique/Reduict et abregé* (1554) *L'art d'arythmetique* (1554) Geneva (Slatkine Reprints) 101 p ARITHMETIC. REPRINTS without comment of these two works.

NIKOLSKII, S M 1972 Some reminiscences of A.I. Maltsev *Russian Math. Surveys* 27(4), 179-187 BIOGRAPHY. USSR. A I MALTSEV. A collection of personal anecdotes about Maltsev and other Russian mathematicians, especially 1934-1943 (D.E. Kullman)

HOFFMAN, Banesh with the collaboration of Helel DUKAS 1972 *Albert Einstein, Creator and Rebel* New York (Viking Press) 272 p A EINSTEIN. M BESSO. N BOHR. M PLANCK. RELATIVITY. An informal personal biography with popular discussion of scientific ideas and about 75 photographs. Dukas was Einstein's secretary for his last 27 years.

- ABDI, Wazir Hasan 1972 Did Australians in antiquity count? *School Mathematics Journal* (The Mathematical Association of South Australia) 10(4), 3-6
AUSTRALIA. NUMBER CONCEPT. PRIMITIVE MATHEMATICS.
A brief popular discussion of primitive number systems with information about those used by Australian aborigines.
- MCLEAN, Antonia 1972 *Humanism and the Rise of Science in Tudor England* (Neale Watson Academic Publications)
258 p US \$10.50 HARRIOT. SCIENCE. XVI. A description of the sixteenth century as a period of revolutionary breakthrough initiated by the invention of printing and laying the basis for the scientific advances of the following century. Numerous references to mathematics and mathematicians. Not well-indexed except by persons. Facsimile of calculation by Harriot in binary numeration and of his theorem on conformality.
- GUPTA, R C 1972 Neelakantha's rectification formula. (Glimpses of ancient Indian mathematics, no. 1)
The Mathematics Education 6(1), 1-2 CIRCULAR ARC LENGTH. MEDIEVAL INDIAN MATHEMATICS. NEELAKANTHA SOMAYAJI. TRIGONOMETRY. XV. The paper describes an approximation formula for the angle when its sine or cosine is given.
- BOYARSKII, E A 1972 *Poryadkovye statistiki* (Order Statistics) Moscow (Statistika) 117 p 35 k
ORDER STATISTICS. This survey contains a very brief historical sketch and short bibliography.
- MAINZER, K 1972 Mathematischer Konstruktivismus im Lichte Kantischer Philosophie. *Philosophia Mathematica* 9(1), 1-26 CONSTRUCTION CONCEPT. FORMALISM. KANT. P. LORENZEN. OPERATIONALISM. A discussion of Kant's concept of construction in relation to the work of modern formalism and Lorenzen's operationalism. Not a discussion of modern constructivism in the foundations of mathematics.

STUBBE, Hans 1972 *History of Genetics From Prehistoric Times to the Rediscovery of Mendel's Laws* Translated by T R W Waters from the second edition of *Kurze Geschichte der Genetik bis zur Wiederentdeckung der Vererbungsregeln Gregor Mendels*, 1965. Cambridge, Mass. (MIT Press) 366 p \$14.95 GENETICS. From prehistoric times through the beginnings of the chromosome theory of heredity. Many illustrations, a translation of Mendel's letter to Carl von Nägeli of July 3, 1870, and a 39-page bibliography.

ANONYMOUS 1972 *Preserving the history of computing*. Montvale, N J (American Federation of Information Processing Societies) 16 p COMPUTER SCIENCE. This brochure describes a cooperative project of the Smithsonian Institution and the American Federation of Information Processing Societies. It gives a brief history, describes plans, asks for assistance in the work, and presents the need for additional funding.

COSTABEL, Pierre 1972 Bernard Rochot (1900-1971) *Revue d'histoire des sciences et de leur applications* 25(3), 275-277 BERNARD ROCHOT (OBITUARY). PIERRE GASSENDI. M MERSENNE. His most important works were two studies on Gassendi and editing volumes six through twelve of the correspondence of Mersenne.

TOYA, Seiiti 1972 *Keisan To Keisankiki No Rekishi* (History of Calculation and Calculating Machines) Tokyo (Fuji Tankidaigaku Shuppanbu), 186 p ABACUS. ARITHMETICAL COMPUTATION. CALCULATING MACHINES. NUMERATION. SLIDE RULE.

ECCARIUS, Wolfgang 1972 Der Oberbaurat August Leopold Crelle und dessen Beteiligung an der Planung und Ausfuehrung des fruehen preussischen Eisenbahnwesens (Superintendent August Leopold Crelle and his participation in planning and building the early Prussian railways) *Jb. f. Wirtschaftsgeschichte* 6, 163-170 A L CRELLE. ENGINEERING.

- AKSENOVA, E A 1972 Ob istochnike kinematicheskoi formy isnovnoi teoremy analiza u Nyutona (On the sources of the kinematic form of the fundamental theorem of calculus in the work of Newton) *Problemy istorii matematiki i mekhaniki* 1, 31-39 FUNDAMENTAL THEOREM OF CALCULUS. I. BARROW. I. NEWTON.
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- KELLAWAY, F W, Editor 1970 *Metriation* (Revised Edition) Harmondsworth, England (Penguin) 124 p £30 METRIC SYSTEM. Though primarily a guide to the changeover in Great Britain, it contains some history in the first chapter (5 pages) by Norman Clarke.
- SHKOLENOK, Galina A 1972 Geometrical constructions equivalent to non-linear algebraic transformations of the plane in Newton's early papers. *Arch. Hist. Exact Sci.* 9, 22-44 ALGEBRAIC TRANSFORMATIONS. GEOMETRIC CONSTRUCTIONS. GEOMETRIC TRANSFORMATIONS. GEOMETRIC GENERATION OF CURVES. I NEWTON. PLANE CURVES. A discussion of Newton's geometrical constructions of plane curves from what the author describes as the "anachronistic viewpoint" of the modern theory of algebraic transformation plain curves.

- GUPTA, R C 1972 Brahmagupta's rule for the volume of frustum-like solids. (Glimpses of ancient Indian mathematics, no. 4) *The Mathematics Education* 6, 117-120
- BRAHMAGUPTA. VOLUMES OF FRUSTUMS. The author compares a formula for volumes of frustums contained in Brahmasphuta Siddhanta (628 AD) with various related formulas including the Babylonian formula for the truncated pyramid.
- BIERMANN, Kurt-R 1972 Alexander von Humboldt über den Vorläufer des programmgesteuerten Rechenautomaten (Alexander von Humboldt on the precursor of stored program computers) *NTM* 9, 21-24
- CHARLES BABBAGE. ALEXANDER VON HUMBOLDT. STORED PROGRAM COMPUTERS. An account of the relations between Babbage and Humboldt, particularly with reference to Babbage's machine and Humboldt's appreciation of its importance. Based in part on correspondence between the two men.
- BAER, Robert M 1972 *The Digital Villain. Notes on the Numerology, Parapsychology, and Metaphysics of the Computer* Reading, Mass. (Addison-Wesley) 187 p \$2.95
- AUTOMATA. COMPUTERS. COMPUTER SCIENCE. CYBERNETICS. POPULARIZATIONS. This informal material, designed for the first part of a university introductory computer science course, includes some history, description of current meta-computer problems, and futurology.
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- AXIOMATICS. D HILBERT. G PEANO. A discussion of the transition from viewing axioms as contentive statements to the modern abstract and formal interpretation.
- ERCOLANO, Joseph 1972 Making golden cuts with a shoemaker's knife *Fibonacci Quart.* 10, 439-440
- ARBELOS. ARCHIMEDES. GOLDEN SECTION. SHOEMAKER'S KNIFE. This note attempts to justify bestowing the title of "golden" on the arbelos or shoemaker's knife of Archimedes. (Abstracted by D E Kullman)

SWENSON, Loyd S, Jr 1972 *The Ethereal Aether. A History of the Michelson-Morley-Miller Aether-Drift Experiments, 1880-1930.* With a foreword by Gerald Holton. Austin (University of Texas Press) 383 p OPTICS. RELATIVE MOTION. RELATIVITY. In addition to the historical narrative, there are facsimile reprints of an article by Michelson (1881), and two by Michelson and Morley (1886, 1887), a note on sources, and a 57-page bibliography.

KUDRYASHOVA, L V 1972 Formirovanie osnovnykh uravnenie dinamiki tverdogo tela v rabotakh L. Euler (The formation of the basic equations of dynamics of heavy bodies in the work of L. Euler) *Problemy istorii matematiki i mekhaniki* 1, 91-99 EQUATIONS OF MOTION. L EULER.

D'AMBROSIO, Ubiratan 1972 Dynamical Systems and Huygens' Principle *Philosophia Mathematica* 9, 27-39 DYNAMICAL SYSTEM. HUYGENS' PRINCIPLE. DIFFERENTIAL EQUATIONS. An analysis in terms of modern conceptions and research.

ASSER, Günter & FLACHSMEYER, Jürgen & RINOW, Willi, Editors 1972 *Theory of Sets and Topology, in Honour of Felix Hausdorff (1868-1942)* Berlin (VEB Deutscher Verlag der Wissenschaften) 525 p FELIX HAUSDORFF (PORTRAIT, BRIEF NOTE). CANTORIAN MATHEMATICS. CATEGORY THEORY. SET THEORY. TOPOLOGY. XX. Forty articles, including Z Semadeni on "Is the Cantorian mathematics symmetric?" (467-472)

KIMBERLING, Clark H 1972 Emmy Noether *Amer Math Monthly* 79, 136-149 P S ALEXANDROV. GERMANY. E NOETHER. M NOETHER. A sketch of the life and work of Emmy Noether with a brief list of secondary sources, quotations from an address by Hermann Weyl, a lengthy excerpt from an unpublished address by P S Alexandrov, and a description of previously missing letters by Dedekind, Frobenius, G Cantor and H Weber now in the Clifford Memorial Library at the University of Evansville.

STEPANOV, S Yu 1972 Teoriya gidrosinamicheskikh reshetok v rabotakh N. E. Zhukovskogo i S. A. Chaplygina i ee posleduyushchee razvitie (The theory of hydrodynamic lattices in the works of N E Zukovskii and S A Chaplygin and its subsequent development) *Izv. Akad. Nauk SSSR Ser. Meh. Zidk. Gaza* 2, 3-8 AIR FOILS. S A CHAPLYGIN. HYDRODYNAMIC LATTICES. L I SEDOV. TURBINES. P A VALTER. N E ZUKOVSKII. Bibliography (22 items).

KNOBLOCH, Eberhard 1972 Die entscheidende Abhandlung von Leibniz zur Theorie linearer Gleichungssysteme (The decisive paper of Leibniz on the theory of linear systems) *Studia Leibnitiana* 4, 163-180 DETERMINANTS. G LEIBNIZ. The author here publishes for the first time a manuscript on linear systems of equations written in 1684 and containing anticipations close to Cramer's rule, the representation of determinants by the diagonal terms, and several theorems on determinants.

MERKULOVA, N M 1972 Sozdanie sovremennoi teorii profilya kryla (1906-1911) [The establishment of the contemporary of profile of an airfoil (1906-1911)] *Problemy istorii matematiki i mekhaniki* 1, 113-118 AERODYNAMICS. AIRFOILS. S A CHAPLYGIN. W M KUTTA. N E ZHUKOVSKII.

CARDWELL, D S L 1972 *Turning Points in Western Technology. A Study of Technology, Science and History* New York (Neale Watson) 255 p \$10.50 (paper \$5) TECHNOLOGY. Mathematical technology is almost ignored, with a few mentions of the modern computer and no reference to other calculating devices, mathematical machines, or instruments.

TYULINA, I A & CHINENOVA, V N 1972 Osnovnye ponyatiya kinematika v knige E. Bura *Kurs mekhaniki mashin* (The fundamental concept of kinematics in the book of E Bour *Cours de mécanique et machines professé à l'Ecole Polytechnique, f.1, Cinématique*, Paris, 1862) *Problemy istorii matematiki i mekhaniki* 1, 133-138 E BOUR. KINEMATICS. H A RASAL. A discussion of the role of Bour in developing kinematics as a separate discipline along the lines established by A M Ampère.

MAY, K O & GARDNER, C M 1972 *World Directory of Historians of Mathematics* Toronto (Historia Mathematica) 48 p \$4 (\$3 prepaid) DIRECTORIES. INFORMATION RETRIEVAL. HISTORIOGRAPHY OF MATHEMATICS. A list of names, addresses, and fields of interest of scholars who are or have been teaching, doing research, or publishing in the field of history of mathematics. There are indexes by countries and by topics. Also, a brief description of the Commission on the History of Mathematics and a list of its members.

TYULINA, I A 1972 *Shest lektsii po istorii mekhaniki* (Six lectures on the history of mechanics) *Problemy istorii matematiki i mekhaniki* 1, 61-80 J L D'ALEMBERT. COMPOSITION OF FORCES. EQUATIONS OF MOTION. EQUILIBRIUM. GEOMETRIC STATICS. C HUYGENS. J L LAGRANGE. MECHANICS. I NEWTON. PENDULUMS. VIRTUAL DISPLACEMENTS. VIRTUAL VELOCITIES.

HERRMANN, D B 1972 *Aus der Entwicklung der Groessenklassen-Definition im 19. Jahrhundert* (On the development of the definition of magnitude classes in the 19th century.) *Die Sterne* (Mitteilungen der Archenhold-Sternwarte Berlin-Treptow Nr. 105) 48(1/2), 1-19 G T FECHNER. N R POGSON. SCALES OF MEASUREMENT. STAR MAGNITUDES.

MACDONALD, I D 1972 *The discovery of real numbers. The Australian Math. Teacher* 28(3), 119-124 CANTOR. DEDEKIND. REAL NUMBERS. WEIERSTRASS. 1872. A discussion of the nature and significance of "the culmination of a very long process of discovery, of elucidation, and of formalization" in 1872 by the contributions of Weierstrass, Cantor, and Dedekind to the definition of real numbers.

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- INGRAHAM, Mark H 1972 *Charles Sumner Slichter. The Golden Vector* Madison, Wis. (University of Wisconsin Press) 328 p \$10 GROUND WATER. CHARLES S SLICHTER. UNIVERSITY OF WISCONSIN. Biography of Slichter. Slichter was a member of the mathematics department from 1886, its chairman from 1906, and dean of the graduate school from 1920 at the University of Wisconsin.
- SWETZ, Frank 1972 The Chinese mathematical Olympiads: a case study. *Amer. Math. Monthly* 79, 899-904 CHINA. HISTORY IN MATHEMATICS EDUCATION. MATHEMATICAL COMPETITIONS. OLYMPIADS. XX. Covers the period 1946-1963.
- COOPER, Lane 1972 *Aristotle, Galileo and the Tower of Pisa* (Reprint of the 1935 first edition) Port Washington, N.Y. (Kennikat Press) 102 p \$6.75 ARISTOTLE. FREE FALL. GALILEO. A collection of materials relating to the alleged experiment in which Galileo dropped two balls from the Tower of Pisa.
- KLEIN, Martin J 1970 *Paul Ehrenfest. Volume I: The Making of a Theoretical Physicist* Amsterdam (North-Holland) 346 p \$9.50 PAUL EHRENFEST. QUANTUM PHYSICS. PORTRAITS. THEORETICAL PHYSICS. This first of two volumes covers the period through World War I. There is a portrait and 13 other photographs of people, places, and documents. Topical index.
- SIMONOV, R A 1972 *Drevnerusskii tsifrovoy perechen v pergamennoi rukopisi XV v.* (An early Russian numerical list in a parchment manuscript of the 15th century) *Problemy istorii matematiki i mekhaniki* 1, 45-46 MEDIEVAL MATHEMATICS. NUMERATION. RUSSIA. The author points out the importance of such sources because of the lack of documents on the development of mathematical ideas in Russia in the Middle Ages, and describes a particular document in relation to similar ones from the preceding two centuries and the one following.

HOLTON, Gerald, Editor 1972 *The Twentieth-Century Sciences* New York (W. W. Norton) 542 p US \$15
COMPLEMENTARITY. COMPUTERS. ALBERT EINSTEIN.
GENETICS. INFORMATION PROCESSING. ERNST MACH.
MATHEMATICAL ECONOMICS. PAUL A SAMUELSON (AUTO-
BIOGRAPHICAL). SOCIOLOGY OF SCIENCE. Although
this collection of 15 essays include none on
mathematics, whose omission is mentioned in
passing in the editor's introduction on the
relevance of science, several essays deal with
topics closely related to mathematics, especially
that by W O Baker (480-512) on computers as
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All but three of the essays appeared previously in
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61 (Jan-Feb 1973), 103).

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L BOLTZMANN. CHAPMAN. DIFFUSION. D ENSKOG.
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J C MAXWELL. TRANSPORT EQUATIONS. VISCOSITY. A
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of work going back a half-century and reprints of key
papers, the last one Chapman's "The kinetic theory of
gases 50 years ago" (1966).

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Vista), New York (Van Nostrand Reinhold) 96 p \$5.50
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A popular discussion of the interplay between art
(primarily painting, sculpture, and architecture) and
mathematics.

CHANDLER, BRUCE + VINCENT, CLARE 1969 *Three Nuernberg
Compassmacher. Hans Troschel the Elder, Hans
Troschel the Younger, and David Beringer*
Metropolitan Museum Journal 2, 211-216
DAVID BERINGER. HANS TROSCHER THE ELDER. HANS
TROSCHER THE YOUNGER. INSTRUMENTS. SUNDIALS.
A discussion of the dating and authorship of four
sundials in the Metropolitan collection. Excellent
photographs are included.

SAIDAN, A S, Ed 1971 *Arabic Arithmetic. The Arithmetic of Abu al-Wafa' al-Buzajani, 10th Century, Mss. Or. 103 Leiden & 42 M Cairo. Edited With Introduction, Commentaries and Ample References to the Arithmetic of al-Karaji (11th Century)* 855 Istanbul Amman, Jordan (Jordanian University) 468 p (Entirely in Arabic) US \$5.00 ABU AL-WAFA'. AL-KARAJI. ARAB MATHEMATICS. ARITHMETIC. BABYLONIAN MATHEMATICS. FINGER RECKONING. GREEK MATHEMATICS. SEXAGESIMAL SYSTEM. X. XI. One of a planned series of books on the arithmetical systems known in medieval Islam. The introduction and commentaries occupy about 120 p. (Reviewed by D A King 1973 *Isis* 64, 123-125)

EVES, Howard W 1971 *The Other Side of the Equation. A Selection of Mathematical Stories and Anecdotes* Boston (Prindle, Weber & Schmidt) 94 p \$2.50 (paper) COLLECTIONS OF ANECDOTES. A selection from Eves' *In Mathematical Circles* (1969) and *Mathematical Circles Revisited* (1971).

KORDIG, Carl R 1971 *The Justification of Scientific Change* New York (Humanities Press) 133 p US \$11.00 HISTORICAL THEORY. HISTORIOGRAPHY OF SCIENCE. SCIENTIFIC REVOLUTIONS. A critique of the ideas of Feyerabend, Hanson, Kuhn, Toulmin, and others, and a presentation of the author's own view, which he describes as permitting the appeal to invariances and the comparison of radically different scientific theories.

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LI, H Y & Sibley S Morrill 1971 *I Ching Games of Duke Tan of Chou and C C T'ung* San Francisco (The Cadleon Press) 138 p A largely speculative 15-page account of the ancient TANGRAM puzzle ("Seven-Game" or "Wisdom Plan") attributed by the authors to Duke Tan, the similar "Fifteen-Game" invented in the nineteenth century by T'ung, an alleged link with the ancient I CHING [or Book of Changes] tangrams (62 pages), two unidentified Chinese tales (10 pages), examples of the fifteen-game (31 pages), a diagram of the original square arrangements, some generalities on solutions, diagrams of the possible convex polygons, notes that include several incomplete citations to the literature, and cardboard and plastic pieces for the puzzles.

BAHRDT, Hanse Paul 1971 *Wissenschaftssoziologie -- ad hoc. Beiträge zur Wissenschaftssoziologie und Wissenschaftspolitik aus den letzten zehn Jahren* [Sociology of Science -- ad hoc. Contributions to the Sociology and Politics of Science in the Last Ten Years] Düsseldorf (Bertelsmann Universitätsverlag) 282 p SOCIOLOGY OF SCIENCE. SCIENCE POLICY. SCIENCE OF SCIENCE. Volume 25 in a series on these topics.

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ROBINSON, G de B 1971 SAMUEL BEATTY *Canad. Math. Bull.* 14(4), 498-490 OBITUARY.

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PORTRAIT. OBITUARY. Brief personal recollections by the President of the University of Alberta. (H.S. Tropp)

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SHANKAR, H editor 1970 *Mathematical Essays Dedicated to A.J. Macintyre* Athens, Ohio (Ohio University Press) 393 p PORTRAIT, brief biography, and BIBLIOGRAPHY of A J MACINTYRE (1908-1967) and 35 mathematical papers on a variety of topics.

PALTER, Robert 1970 *The Annus Mirabilis of Sir Isaac Newton 1666-1966* Cambridge, Mass and London (M.I.T. Press) 359 p Sixteen papers (9 with comments) on the work of I NEWTON first prepared for the 1966 Conference on Newtonian Studies at the University of Texas, and including D.T. Whiteside on mathematics, P. Costabel and J. Herivel on dynamics, I.B. Cohen on force, and C. Truesdell on mechanics.

KHADEEV-JAM, translator 1970 *Iḥṣā' al-'ulum* [Enumeration of the Sciences] by Abū Naṣr Muḥammad ibn Muḥammad al-Fārābī Persian translation Teheran (Cultural Center of Iran) AL-FARABI. Introduction by the translator, preface, and five chapters: language; logic; science of sciences (mathematics); natural sciences and theology; and science of civilization, religious science and declamation. (A.R. Amir-Moez)

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